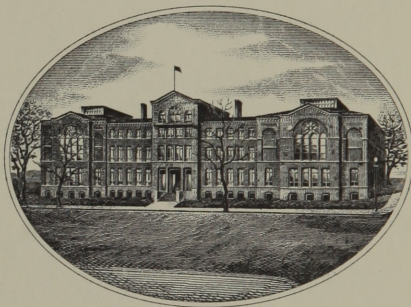


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76

AN  
INAUGURAL ESSAY,  
ON THE  
LUPULUS COMMUNIS,  
OF  
*GÆRTNER;*  
OR THE  
COMMON HOP.

---

BY WAKEMAN BRYARLY,

*OF MARYLAND.*

HONORARY MEMBER OF THE PHILADELPHIA MEDICAL SOCIETY.

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PHILADELPHIA:

PRINTED FOR THE AUTHOR, BY JOHN H. OSWALD.

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1805.





AN  
INAUGURAL DISSERTATION,  
FOR  
*THE DEGREE*  
OF  
DOCTOR OF MEDICINE,  
SUBMITTED TO  
*THE EXAMINATION*  
OF THE  
REV. JOHN ANDREWS, D. D. PROVOST, (Pro Tem.)  
THE  
TRUSTEES AND MEDICAL PROFESSORS  
OF THE  
*UNIVERSITY OF PENNSYLVANIA,*

On the 5th day of June, 1805.

To Mr Dorsey  
with the Compl  
I best wishes  
of his friend.  
The Author

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TO

DOCTOR JAMES GLASGOW,

OF

*BALTIMORE,*

THIS

DISSERTATION,

IS DEDICATED

AS A TESTIMONY OF RESPECT,

BY HIS FRIEND AND PUPIL,

THE AUTHOR.

DOCTOR JAMES GLASGOW

PROMOTER OF SCIENCE

REMARKS ON

BENJAMIN S. BARTON, M.D.

OF

MATHEMATICS, NATURAL HISTORY

AS A TESTIMONY OF RESPECT

ROBERT

BY HIS FRIENDS

UNIVERSITY OF PENNSYLVANIA

IMPERFECT ESSAY

AND

THE AUTHOR



TO THE  
PROMOTER OF SCIENCE,  
AND THE  
*FRIEND OF HUMANITY,*  
BENJAMIN S. BARTON. M. D.  
PROFESSOR  
OF  
MATERIA MEDICA, NATURAL HISTORY,  
AND  
*BOTANY,*  
IN THE  
UNIVERSITY OF PENNSYLVANIA.

THIS  
IMPERFECT ESSAY

is also inscribed

BY HIS SINCERE FRIEND,

THE AUTHOR.

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## PREFACE.

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I HAVE chosen for the subject of my Inaugural Dissertation, the *Humulus Lupulus* of Linnæus, the *Lupulus communis* of Gærtner, or the *Common Hop*. ✕

I have thought it unnecessary to say any thing respecting its *natural history*, as it is diffused through every part of the United States, and is a native of both the old and new worlds. The cones are the only portion of the vegetable, which is used in medicine.

It would be much more congenial to my inclinations to glide through the process of graduation, in obscurity, than thus publicly to subject myself to the criticisms of the world : but as the laws of the University require a dissertation from every candidate for medical honors, I am compelled to submit this, to the inspection of the public ; and hope that its being the production of a juvenile mind, impelled by necessity, and not led by choice, will apologise, in some measure, for its imperfections.

✕ The active principle is called *Lupulin* —



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# CHEMICAL

AND

PHARMACEUTICAL TREATMENT.

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## *EXPERIMENT I.*

Four drachms of the *Lupulus* were put into a glass vessel, into which twelve ounces of pure water were infused, and the precaution taken of keeping it well closed. After macerating twenty-four hours, it was put into a glass retort, to which a receiver was adapted, the retort was then exposed to a moderate heat in Blake's furnace.

In five hours, the contents of the retort were reduced to a dry cake, and a white transparent fluid had passed over into the receiver.

The distilled fluid had an empyreumatic smell, and possessed, in an eminent degree, the bitter property of the vegetable.

It was then tested by the tincture of litmus, by which it was converted to a red colour, but underwent no change of colour by the oxy-sulphate of iron; a variety of tests



were then unsuccessfully tried, in order to ascertain what acid it was.

## EXPERIMENT II.

One pint of water was poured upon four drachms of the lupulus, in an open vessel, and subjected to a gentle heat, till reduced to half the quantity; it was then passed through a filter; the fluid after percolation was yellow, very bitter, and emitted, in some degree, the odor of the plant.

## EXPERIMENT III.

Six drachms of the lupulus were put into a glass bottle, to which twelve ounces of water were added; after macerating five days, with frequent agitation, the liquor was poured off and strained.

It was neither so bitter, nor so yellow as the decoction, but was endowed with more of the odor peculiar to the vegetable.

## EXPERIMENT IV.

Four drachms of the lupulus were put into a glass bottle, into which ten ounces of highly rectified spirits of wine were infused. After the lapse of five days, in which

time it was frequently agitated, it was decanted and filtrated.

The tincture was very green, and extremely bitter, and formed a white precipitate by the addition of water.

### EXPERIMENT V.

Eight ounces of proof spirit were put into a bottle, to which two drachms of the lupulus were added. After macerating 6 days, the liquor was poured off and passed thro' a filter.

It was slightly yellow, and not so bitter as the alchoholic tincture, but more so than either the decoction or the infusion.

### EXPERIMENT VI.

A decoction obtained by means of *experiment* 2, was exposed to heat in an open vessel: it afforded me, after evaporation, a dark coloured bitter substance, which weighed one drachm and an half.

### EXPERIMENT VII.

Four drachms of the lupulus were put into a bottle, to which a quantity of water, sufficient to cover them, was added. After ma-



cerating twenty-four hours, it was poured off, and another portion of water added ; after repeating the affusion four times, it was strained, and exposed in an open vessel, to heat : when evaporated to dryness, it afforded a residue of one drachm, of a dark, gummy, and somewhat bitter substance.

### EXPERIMENT VIII.

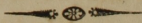
Four drachms of the lupulus were put into a bottle, to which several portions of highly rectified spirits of wine were alternately added and poured off. It was then passed through a filter, and exposed in an open vessel, to the sun, for evaporation : it left one drachm and ten grains, of a dark, resinous substance, at the bottom of the vessel : it was much more bitter than either the extract or the gum.

### EXPERIMENT IX.

To two drachms of the lupulus, in a bottle, six ounces of proof spirit were added. After macerating three days, it was poured off, and exposed, in an open vessel, to a gentle heat. There remained, after evaporation, thirty grains of a gummy, resinous



substance. It was more bitter than either the gum or the extract, but not so much so, as the resin.



It appears, from the preceding experiments, that a moderate degree of heat is sufficient to volatilize the bitter principle in a large proportion; and that there exists in the lupulus, an acid, in a free state, which it would seem is *sui generis*. But I had not a sufficiency of time and opportunity to prosecute the investigation as far as I could have wished.

The odor of the hop is easily dissipated by heat, which appears from every experiment in which it was used.

The bitter resides much more in the resin, than in the gum.



## EXPERIMENTS

ON

## THE HUMAN SYSTEM.

### *Experiment 1.*

At ten o'clock in the morning, two hours after a light breakfast, I took twenty grains

of the powder, suspended in water ; my friend and fellow graduate, Mr. Mitchell, attending to the pulse, beating 80 strokes in a minute.

Minutes	5	10	15	20	25	30	35	40	45	50	55	60	70	80
Pulse,	83	85	82	80	78	80	77	75	76	78	78	80	79	80

The powder was very bitter, and excited much nausea and burning in the fauces, which continued for a considerable length of time. In five minutes the pulse was fuller and stronger. In twenty minutes the pulse became languid, and the nausea increased very much. In 70, the nausea went off, and the pulse became natural. The flow of urine was very sensibly increased.

### *Experiment 2.*

At 11 o'clock, A. M. Mr. Mitchell took twenty-five grains of the powder, in a very small quantity of water ; his pulse beating 62 in a minute.

Minutes	5	10	15	20	25	30	35	40	45	50	55	60
Pulse,	63	60	58	60	60	59	51	56	52	53	58	60

In five minutes the pulse was increased in fulness. In fifteen there was much nau-



sea, with an inclination to puke. In 30 minutes the nausea and sickness became very considerable : in less than an hour it operated powerfully, as a cathartic.

### *Experiment 3.*

At five o'clock P. M. two hours after my usual dinner, I took one ounce of the decoction, with my pulse beating 80 strokes in a minute, my ingenious and worthy friend Mr. Merry attending to it.

Minutes,	5	10	15	20	25	30	35	40	45	50	55	60
Pulse,	80	82	81	80	80	80	80	80	80	80	80	80

The decoction was very disagreeable, and occasioned much nausea. At ten minutes, the pulse was somewhat fuller than natural, but suffered very little alteration.

### *Experiment 4.*

At ten o'clock, A. M. I took forty drops of the alcoholic tincture, my pulse beating 74 in a minute ; Mr. Merry attending to it.

Minutes,	5	10	15	20	25	30	35	40	45	50	55	60
Pulse	76	80	83	81	81	79	77	74	75	74	74	74

In fifteen minutes, the pulse became fuller and stronger. At twenty there was a sen-



sation of fulness and tension in the head, with evident narcotic effects. At twenty-five, the drowsiness increased and the pulse became very languid. At thirty-five, the drowsiness diminished, and at forty-five went off almost entirely. At sixty, the pulse resumed its natural fullness. The secretion by the kidneys was very sensibly augmented.

### *Experiment 5.*

At 11 o'clock, A. M. Mr. Merry took 80 drops of the alchoholic tincture, his pulse beating 58 strokes in a minute.

Minutes,	5	10	15	20	25	30	35	40	45	50	55
Pulse,	63	61	60	61	59	58	58	58	58	58	58

At fifty-five he took thirty drops more.

Minutes	60	65	70	75	80
Pulse	61	60	58	58	58

In five minutes the pulse was increased in fulness and strength : at fifteen the pulse became small and much drowsiness supervened : at twenty the system became languid, attended with profuse diaphoresis. At 30 the narcotic effects were much less, and at 40 they went off almost entirely : at 60 the pulse was fuller than natural : at 70

it became depressed and languid. It operated on the urinary organs.

### *Experiment 6.*

At five o'clock, P. M. I took one ounce of the aqueous infusion; it was extremely disagreeable and excited much nausea, but had no sensible effect on the pulse.

### *Experiment 7.*

At 8 o'clock in the morning, Mr. Mitchell took six grains of the resin, dissolved in a very small portion of alcohol; his pulse beating 70 in a minute.

Minutes	5	10	15	20	25	30	35	40	45	50	55	60
Pulse,	73	76	76	78	74	72	72	70	71	70	70	70

In ten minutes the pulse was increased in fullness and strength; at 20 he felt much elated; at 40 he became languid; at 70 the pulse resumed its natural force.

### *Experiment 8.*

At 9 o'clock in the morning, I took eight grains of the extract, dissolved in water; my pulse beating 74 in a minute; Mr. Merry attending to it.

Minutes,	5	10	15	20	25	30	35	40	45	50	55	60
Pulse,	76	76	75	74	74	72	73	74	74	74	74	74



It produced much nausea and sickness, with a great disposition to vomit: at ten minutes the pulse was fuller than natural; the nausea continued for a considerable length of time.

### *Experiment 9.*

At half after ten in the morning, I took 70 drops of the tincture with proof spirit; Mr. Merry attending to the pulse, beating 76 in a minute.

Minutes,	5	10	15	20	25	30	35	40	45	50	55	60
Pulse,	78	79	78	78	79	78	78	77	76	76	75	76

In ten minutes the pulse was fuller than natural; it exerted very sensible effects on the head, and caused some drowsiness.

### *Experiment 10.*

At 8 o'clock, A. M. Mr. Merry took 8 grains of the gummi-resinous extract, dissolved in proof spirit, his pulse beating 58 in a minute.

Minutes,	5	10	15	20	25	30	35	40	45	50	55	60
Pulse,	60	61	63	63	60	58	58	59	58	58	58	58

In five minutes the pulse became much fuller and stronger, and continued so 'till



the 25th minute, after which it resumed its natural fulness and force. At 15 there was some pain and tension in the head. At twenty five there was an increased perspiration. It acted very evidently as a diuretic.

### *Experiment 11.*

At 9 o'clock in the evening, I took ten grains of the gum dissolved in water; Mr. Mitchell attending to the pulse, beating 76 in a minute.

Minutes,	5	10	15	20	25	30	35	40	45	50	55	60
Pulse,	77	78	78	77	76	76	76	76	76	76	76	76

The pulse was very little altered in fulness and force. It excited some nausea, which soon went off.

### *Experiment 12.*

In order to ascertain the effect of the lupulus on the bowels, when taken for some time, I took sixty drops of the tincture, every evening, for one week, and found that it had very little effect on them; but if any thing, it rendered them more laxative.

Two of my friends were so polite as to become the subjects of the same experiment, and with nearly a similar result.



From these experiments, it appears, that the powder acts very considerably as a cathartic, but exerts very little influence on the pulse; this I attributed to the distressing nausea which it induced.

The tincture made with the highly rectified spirits of wine, is the most agreeable preparation, and acts more powerfully as an anodyne than any other, and should always be preferred when this effect is desired.

The infusion and decoction are both very disagreeable, and are much less active than the tinctures.

The resin is more active than the gum, which explains the greater activity of the tincture, than either the infusion or the decoction.

From the preceding experiments with the tincture, and many more which I have thought it unnecessary to relate, it appears, that it acts decidedly as a powerful narcotic, and has this very great advantage, that it either renders the bowels laxative, or leaves them in the same state, in which they were when the medicine was exhibited.



ON THE  
 MEDICAL PROPERTIES  
 OF THE  
 LUPULUS COMMUNIS.

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The Hop was introduced into the *materia medica*, at an early period, and received, like many other medicinal articles, all those extravagant encomiums, which the enthusiastic physician is so much disposed to heap on a medicine that he has employed with advantage.

The advocates of different theories ascribed to this vegetable, different virtues, in order to explain its *modus operandi*, agreeably to the principles they had respectively espoused, as “a sweetner of the blood,” as an “antiseptic,” as an “attenuant,” &c. But these erroneous epithets are now justly discarded; and the fanciful theories which gave them birth, have vanished before the rays of a better light, and will soon be consigned to oblivion.

The hop has either been mentioned very superficially, or passed over entirely, by a majority of modern writers on the *materia*

*medica*. But this should excite no prejudice against it ; for many of the most celebrated and useful medicines of the present day, have, in their turn, experienced the same fate.

Dr. Darwin and Professor Barton,\* have, placed the hop in that extensive and important series of medicines, called *Sorbentia* by the former, and *Bitter Tonics* by the latter.

From the preceding experiments, I am inclined to think it intitled to a respectable station on the list. I will first speak of its utility in

### CALCULUS.

The opinions relative to the exhibition of the hop, as a remedy in, and as a preventive against the formation of, calculus, are directly opposite ; some asserting that the number of calculous cases has augmented : while others contend that they have diminished since the introduction of that article into malt-liquors.

Mr. Ray, who is entitled to much attention, says that calculous cases have become much less frequent in the city of London,

\* MS. Lectures on Materia Medica.



since the use of malt liquors has become more general ; and it appears, from the London bills of mortality, that the disease of calculus has by no means encreased, and that it is not a frequent one in that city, where the use of malt-liquors is so general.

Dr Sydenham complains of the frequency of calculus symptoms in his time ; and observes, that they occurred among his gouty patients, in the decline of life. Here this illustrious physician takes notice of the great analogy that subsists between the two diseases, and that gouty patients were very apt to become calculous in the decline of life. But, to speak more properly, gout and calculus are the *same* disease, differing only in situation. They are both the effect of morbid excitement, or wrong action ; and both consist in a calculous effusion ; the one in the joints, the other in the urinary organs. The mere difference of *situation* can not be said to constitute a difference in the *nature* of them.

From the circumstance of gout being so frequently the effect of the *immoderate* use of ardent spirits, and from calculus being so often the consequence or concomitant of

gout ; we are induced to ascribe Dr. Sydenham's increased number of calculous cases, to the alchohol, and not to the hop.

A. Cyprianus, a writer of high authority, asserts, that he performed the operation of lithotomy, on 1400 patients, and that not one of them was a drinker of malt-liquors ; but that many of them were wine-drinkers. This fact, related by a man of such extensive observation, is entitled to peculiar attention ; for it seems to prove, in a very impressive manner, that the drinking of malt-liquors, seldom, if ever, contributes to the production of calculus.

Dr. Lobb makes the following extravagant assertion respecting the virtues of the lupulus, viz. That the decoction of the plant had, in less than three days, dissolved a very hard calculus ; and that it is one of the more powerful lithontriptics. This assertion I have not thought of sufficient consequence to induce me to put to the test of actual experiment ; but admitting that the decoction had the power of dissolving a calculus *out* of the body, it would by no means follow that it could effect the same *in* the body, after having undergone the course of



the circulation. I wish I could, with safety, bestow upon the lupulus, or any other medicine, the appellation of a *lithontriptic* ; but I fear that many years must elapse before mankind will be blessed with so precious and invaluable a discovery.

Although I cannot ascribe to any medicine the power of *dissolving* a calculus, I will readily admit, that certain medicines may *prevent* the peculiar secretion on which the formation of calculus depends. This secretion is frequently the effect of debility; and the hop, by acting as a tonic, may remove this state of the system, and, of course the further formation will cease.

Experience has taught us, that many of the most efficacious medicines, in procuring relief from calculus, are derived from the class of bitters ; and I should suppose the hop possessed of that power in a very eminent degree ; for, besides its tonic powers, it has the advantage of operating on the urinary organs, in increasing the flow of urine: and, perhaps, all medicines which have that

effect, are of more or less utility in this disease.

It would be as tedious as useless, for me to go through the long catalogue of diseases in which the hop might be used with advantage, as a tonic. The actual state of the system, which is so strongly inculcated, in his lectures, by our Professor of the *materia medica*, should ever direct us in all our prescriptions ; and all diseases arising from a defect of action, in which the union of an agreeable bitter and tonic is indicated, cannot fail of being being benefited by it.

Having finished the consideration of the Hop as a tonic, I proceed, in the next place, to speak of its virtues as a narcotic. This I deem its most valuable property.

I cannot admit, with our illustrious Professor of the Institutes, &c. that the induction of sleep consists merely in elevating or depressing the system, to what he calls the "sleeping point" ; for facts compel us to admit, that some substances are endowed with a soporific quality, and that some pos-



sess the power of inducing sleep much sooner than others ; however inadequate our present knowledge may be to the explanation.

The narcotic effects of the odor of the Hop, are generally known ; and it is very common to send to the brewers to get hops to use in this way. I have heard of several instances, in which the “ hop-pillow ” has succeeded in procuring placid and refreshing sleep ; and it is said, that this kind of pillow produced sleep, during the illness of the present King of England, after his physicians had prescribed every thing else in vain.

From the odoriferous quality of the Hop, I should readily conceive that sleep might be induced by means of the pillow, particularly when we consider, that the patient, from the vicinity of the Hop to the respiratory organs, must necessarily be constantly inhaling the odors. We have also seen, that its properties are easily volatilized by a moderate degree of heat, and that its narcotic effects could not be perceived, in any

of the preceding experiments, when heat had been applied.

From these facts, we must conclude, that the *principium narcoticum*, whatever its precise nature may be, is volatile; and that the odor of the Hop, will produce the effects of the plant, when used in this way.

The narcotic effects of porter, and other potations, in which the Hop is an ingredient, are so evident to all who use them, that they have universally obtained the epithet of "heavy drinks." That the anodyne effects of these liquors are derived from the Hop, is proven by their being proportionate to the quantity of the Hop, which enters into the composition: for instance, beer exerts its anodyne effects more decidedly in the summer, than in the winter; because the brewers find it necessary to use more of the Hop for its preservation, in the former season, than in the latter.

Dr. Barton informs me, that he has himself, repeatedly taken the tincture of the hop, made with the highly rectified spirits



of wine, and that he has frequently prescribed it to his patients. He says it has generally, if not always, seemed to induce evident narcotic effects, similar to those of opium. In himself, in twice the dose of laudanum, it induced sleep as decidedly as laudanum. The Doctor also observes, that it agrees with patients in whom laudanum, or opium in any shape, produces sickness at stomach, head-ache, and other disagreeable effects. He does not assert that it never induces head-ache; on the contrary, he is persuaded that it sometimes does: but he has not known a single case of its producing the disagreeable *pruritus*, or itching, which is so frequently the effect of opium.

I will relate the case of a lady, which Dr. Barton has communicated to me.

Her situation often rendered it necessary for the doctor to prescribe laudanum for her; but the disagreeable effects, such as head-ache and sickness at stomach, which it produced, even in very moderate doses, obliged him to have recourse to some other medicine. The tincture of the hop, in the

dose of forty drops, induced profound and placid sleep, and none of the above disagreeable effects. This was the case on more than one occasion. Dr. A. Fothergill, in a paper published in the *Philadelphia Medical and Physical Journal*, says he has found the hop possessed of an anodyne power, without the disagreeable effects of opium, and that it can be given for any length of time with impunity, whereas the Portland powder, and other bitters, if long continued, seldom fail of producing the most alarming consequences.

I will mention in this respectable Physician's own words, the cases in which he has found it of most advantage.

“ The cases in which I have found it to succeed best, have been such as demanded a light, agreeable bitter, combined with an anodyne quality : as, first—in various cases of dyspepsia, attended with pain and flatulency in the stomach and bowels ; entire loss of appetite, and restless nights. Secondly—in catarrhs and asthmas, and other cases attended with a troublesome tickling cough, and great inquietude. Thirdly—in painful



cases of gravel and stone, or biliary concretions, or severe pains of child bed women. Lastly—in the above and other painful cases, where an opiate was greatly wanted, but could not be exhibited in any of the usual forms, without producing violent retching, severe head-ache, or other very untoward symptoms. Here a strong infusion of the hop, pursued freely, both internally and externally, has seldom failed to soothe the pains, and finally, to procure a calm, tranquil sleep.”

Dr. De Roches relates, several cases in which the hop had succeeded in procuring sleep, after opium had failed.

From the recommendations of Professor Barton, in his lectures, the following gentlemen were induced to prescribe it, and they have been so polite as to communicate to me the result.

Mr. Parish related to me the case of a patient, in which it was necessary to exhibit something to procure rest, and opium always produced very disagreeable effects ; he then

had recourse to the tincture of the hop, which induced all the good, without any of the disagreeable effects of the opium.

Mr. Mitchell informed me, that he has frequently, during the last summer, prescribed the tincture of the hop, as a substitute for laudanum, and that it induced the anodyne effects of the laudanum without any of its disagreeable consequences, such as sickness at stomach, costiveness, &c. In order to make the trial fairer, he gave them other medicines for laudanum, but was unable to procure rest by any of them except the hop.

I gave to a child, that could not rest without laudanum, some of the tincture of the hop, and it induced sleep, equally well with the laudanum.

I was informed, that a gentleman who had been in the habit of using laudanum, wished to discontinue it, but was unable to sleep without it; he had recourse to the tincture of hop as a substitute, with the effect of inducing sleep.



The utility of a medicine, endowed with the divine power of inducing sleep, must be as obvious to the humane physician, who tenderly feels for the distresses of his patient, as advantageous to the unfortunate sufferer, laboring under disease. Nothing, indeed, can give the physician, a more exalted idea of his profession, than the knowledge of being possessed of a medicine, capable of allaying the pains of his patient, and inducing a calm and tranquil sleep.

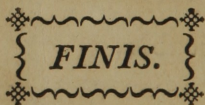
Opium, the medicine generally resorted to for this purpose, was thought of so much importance, that it attained the appellation of the *magnum Dei donum*. But however justly entitled, this celebrated medicine may be, to the highest commendations, many cases must occur to every practitioner, in which its exhibition is either useless, or totally impracticable.

1. Opium, administered in every shape, often fails of inducing narcotic effects. We have seen, in the preceding cases, that the Hop has here succeeded. It must be high-

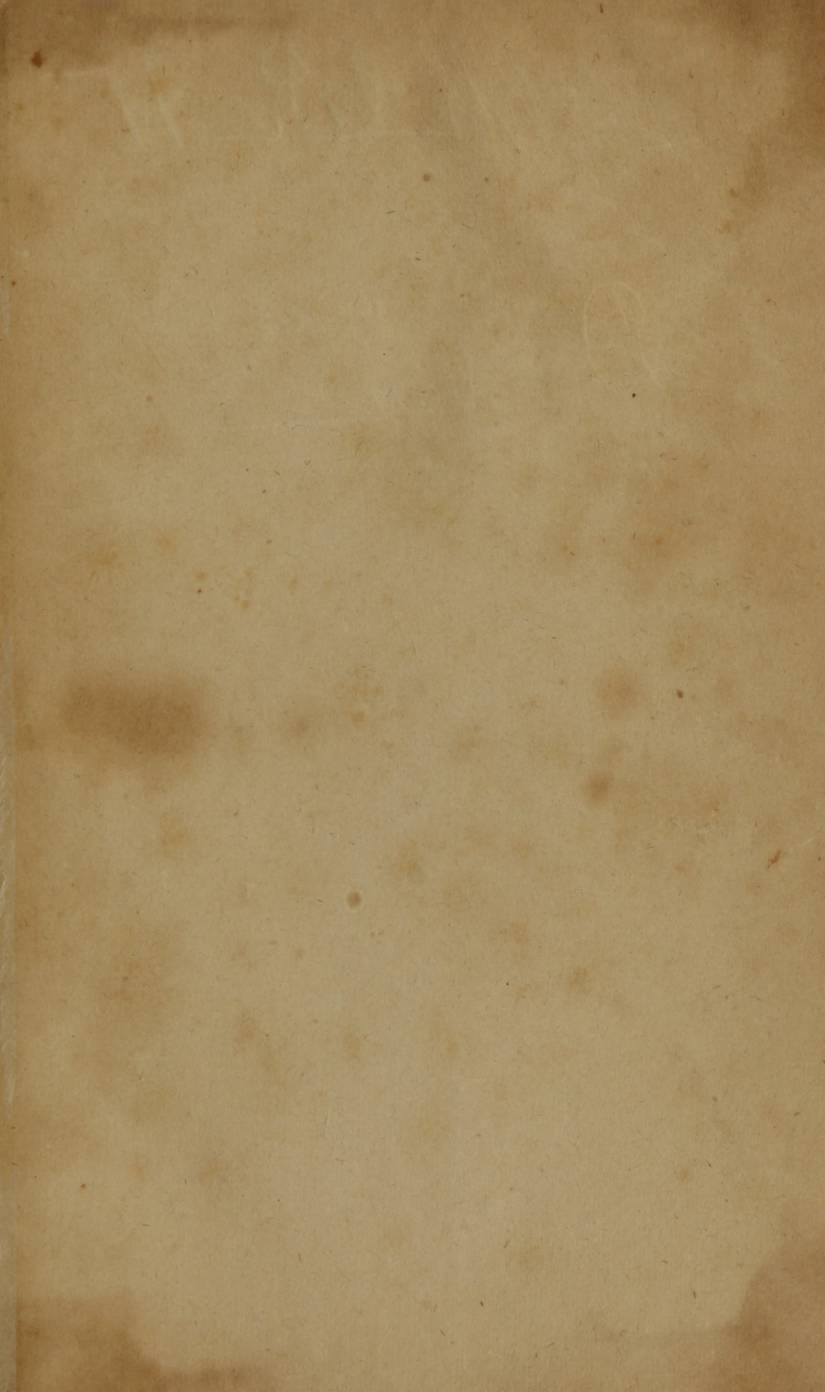
ly consolatory to the physician, to know that he can have recourse to the latter, after the failure of the former.

2. Opium frequently disagrees so much with the constitution, that it cannot be exhibited with advantage. In such cases, the Hop has not disagreed with the patient, and has induced the desired effects.

3. Opium is often rendered inadmissible, from its constipating effects. In this case, the Hop must be an excellent substitute; for, from the preceding experiments, it evidently appears, that it rather augments, than diminishes the alvine excretions.

















Med. Hist.

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